

## SPECIAL ARTICLE

# Cancer pain... who cares?

## International and national patterns of evidence-based global guidelines recommendations for physicians on the Web (2011 vs. 2018)

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### Summary

**Purpose:** Although pain is a common event during treatment of cancer, its assessment and management remains suboptimal in everyday clinical practice at global level.

**Methods:** Considering both the important role of internet in daily life and that clinical guidelines are important for translating evidence in clinical practice, we performed a prospective study to scrutinize the magnitude of updated evidence-based cancer-pain guideline recommendation for physicians on the web. Changes over-time at a global level were scrutinized at two time points: 2011 for baseline and 2018 at first follow-up. Both anesthesiology and oncology societies were analyzed.

**Results:** In 2011 we scrutinized 181,00 WebPages and 370 eligible societies were identified; 364 of these were eligible for analyses both in 2011 and 2018. The magnitude of cancer pain updated and evidence-based guideline recommendations on the web for health care providers was extremely low

at global level and at any time point considered: 1.1% (4/364) in 2011 and 4.7% (17/364) in 2018. Continental and inter-continental patterns, National's highest developmental index, oncology tradition and economic-geographic areas were not found to influence cancer pain web-guideline provision. In 2018, pain & supportive care societies provided the highest rate of updated evidence-based cancer-pain guidelines for clinicians. Only 3/25 medical oncology societies and 1/34 radiation oncology societies, provided own or e-link (to other societies') evidence-based guidelines in their websites.

**Conclusions:** Major medical oncology and radiation oncology societies - at global level - fail to produce updated cancer pain recommendations for their physicians, with most of these providing no or inconsistent or outdated guidelines.

**Key words:** cancer pain, global awareness, guideline implementation, web, medical societies, oncology, anesthesiology

### Introduction

Stepwise improvements in cancer treatment efficacy have been cumulatively achieved across decades and major survival improvements in both palliative

and radical treatment settings have been reached.

Nonetheless, cost-effectiveness remains a strong determinant of rationalized oncology prac-

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tice. Billions are spent each year for prematurely approved costly treatments of uncertain benefit [1] as well as and for genomic diagnostic tests of equivocal utility [2], with most of these being potentially beneficial only for very few and selected group of patients.

But what happens with cancer pain? It affects more than half of cancer patients, with a prevalence of 55% among patients on anticancer treatment, 66.4% among those with advanced metastatic or terminal phases of the disease, and 39.3% following curative treatment [3]. Moderate to severe pain is reported by 38% of all patients [3], with severe impact on quality of life and performance of normal daily activities [4,5]. To date, one third of the patients still do not receive pain medication proportional to their pain intensity levels [6]. Pain research, pain assessment and management remain suboptimal in everyday clinical practice with half of the patients believing that their quality of life is not considered a priority in their overall care by their health care professionals [5,7]. Thus, cancer pain is a serious public health problem and a major concern for more than 10 million people yearly diagnosed with cancer worldwide [8].

How to ameliorate the management of cancer pain, and how to improve and assist the physicians' awareness in cancer pain management in daily clinical activities remains a hostile cornerstone to be solved.

Clinical practice guidelines are important for translating evidence in medical decision making and reducing undesirable practices encouraging services of proven efficacy [9]. Medical guidelines/recommendations provision in websites has been of extreme importance in improving patients' safety, reducing complications and shortening the length of stay among Medicare beneficiaries [10].

Since most recognized medical societies have very extensive membership, organize a large number of educational meetings worldwide, and have substantial influence upon their members, subscribers, and visitors; we hypothesized that one of the possible causes of current medical mismanagement of cancer pain might stem from a low number of web guidelines implementation among oncology, educational and policymaker medical societies. Thus, we set to examine the global coverage of cancer pain guidelines recommendations on the web for clinicians produced by international and national oncology societies. The magnitude of cancer pain guideline production on the web and its changes over time (2011 vs 2018 estimates) were scrutinized in a prospective web-based study. Since different level of development and economy

might largely influence clinical daily practice and priorities in guideline implementation, we further separately scrutinized differences in cancer pain guideline implementation among the 10 highest developed countries [11], the 10 countries with long lasting tradition in medical oncology, and 6 different economic-geographic areas.

## Methods

### *Identification of pertinent societies and caregivers*

In 2011, 181,200 WebPages were scrutinized in order to identify anesthesiology, oncology and pain societies/organizations that might have provided web guidelines regarding cancer pain. We retrieved both international societies (intercontinental, African, Asian, European, Oceanian, North American, South American) and national organizations belonging either to one of the top 10 countries with the highest development index (Norway, Australia, New Zealand, USA, Ireland, Liechtenstein, Netherlands, Canada, Sweden, Germany) [11], or to 10 countries with a long lasting tradition in medical oncology but not included in the top 10 high developed countries (Austria, Belgium, China, Denmark, France, Japan, Italy, UK, Spain, Switzerland) [appendix\_1 methods]. Due to notable economy and development differences between South and North American countries, the continental entities were separately searched and analyzed for North and South America.

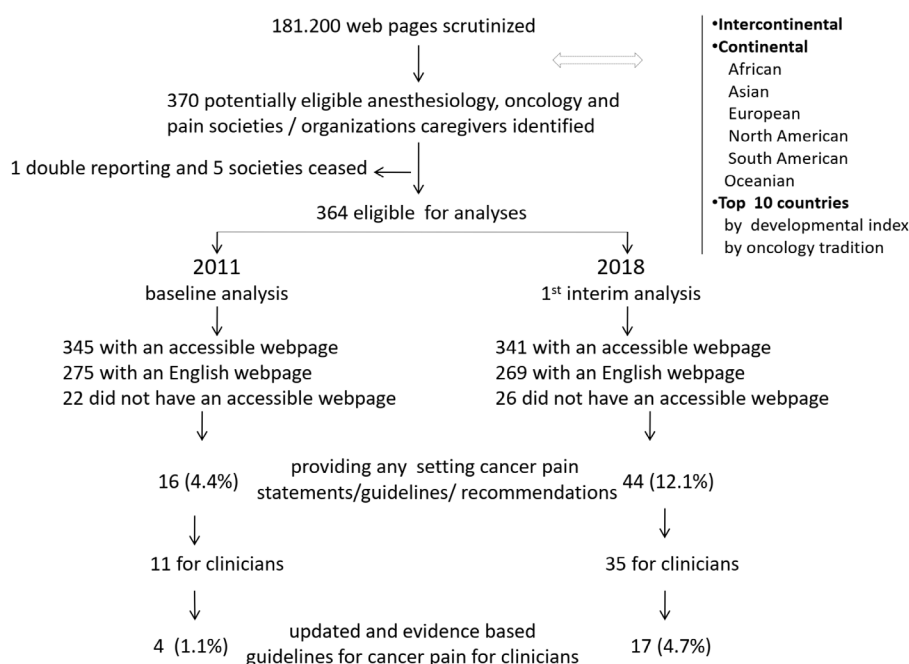
National associations identified were further grouped by geographical-economic areas: Australia-New Zealand, Benelux, United Kingdom of Great Britain and Ireland, German speaking countries, North American, Scandinavian, South European and East Asian countries. Further methodological details are reported in Appendix\_1 methods (Table 1).

Web searches identified 370 potentially eligible societies. Since one society was double reported and 5 societies ceased, 364 societies/organizations were eligible for analyses. (Figure 1. research flow chart). (appendix 2. List of analysed societies).

Screening of the 364 eligible societies' web-sites for guideline recommendations was performed in June 2011 and in June 2018.

### *Outcomes*

To scrutinize the global magnitude of "updated" and "evidence-based" guideline recommendations for cancer pain for physicians on the web and its changes over time. We considered as "updated" all the web guidelines that have been produced or revised or lastly adjourned within the last 5 years. Evidence-based were considered all guidelines including randomized controlled trials and/or meta-analyses in their references. Furthermore, we considered eligible only cancer pain guideline pertaining the general assessment and management of cancer pain. "Solo" specialist guideline (such as "solo" radiation protocols for bone pain among radiotherapy societies, or "solo" intrathecal use of opioids among anesthesiology societies) were not included in the final analyses.



**Figure 1.** Research flow-chart.

## Results

A statistical improvement in the production of evidence-based and updated web-recommendations for cancer pain was observed over time (2011 vs 2018) at global level ( $\chi^2=8.2866$ ,  $p=0.039$ ). Nonetheless, the magnitude of recommendation provision was inquiringly low for any outcome considered. Only 16 and 44 societies / health providers provided some form of cancer pain web-recommendations (any setting considered) in 2011 and 2018; of these, only 4 societies in 2011 [12-15] and only 17 in 2018 [16-32] were providing “updated and evidence-based” cancer pain recommendations for physicians in their web sites (Table 1). Thus, the proportion of medical societies implementing cancer pain updated evidence-based guidelines for clinicians were almost null either in 2011 and 2018 (1.1 vs 4.7%).

In 2011, the 4 societies provided recommendations both for cancer pain assessment and cancer pain treatment [12-15], while in 2018 all the 17 societies were providing recommendations for cancer pain treatment [16-32], but only 10 provided recommendations for cancer pain assessment [21,23, 24-27,30-32].

At their best (2018 analyses), only one intercontinental [16], 3 European [17,18,26], 4 North American [19-22], 3 Dutch [27-29], 2 German [30,31], 1 Japanese [32], 1 Italian [24], 1 Spanish [25], 1 UK [23], and 3 US medical societies (3/56) [20-22] were providing evidence-based updated guidelines for cancer pain in their web sites. No

evidence-based updated recommendations for clinicians were found across African, Asian, Oceanian, South American medical societies, and the societies analyzed of the resting 13 countries (Table 1). Guideline release for clinicians was not influenced by the continent analyzed, the national high developmental index and the national high oncology tradition. Similarly, when the countries were grouped and analyzed by economic-geographic areas (Australia-New Zealand vs Benelux vs German speaking countries vs North American vs Scandinavian vs South European vs Great Britain and Ireland vs East Asian), no statistical differences were found in the proportion of societies providing updated evidence-based web-recommendation for cancer pain (2011: Yates’  $\chi^2=3.719$ ,  $p=0.811$ ; 2018: Yates’  $\chi^2=3.429$ ,  $p=0.843$ ).

Only the society type (anesthesiology vs oncology vs supportive care & pain societies) was found to influence cancer pain web-guideline provision in 2018 (Yates’  $\chi^2=6.994$ ,  $p=0.030$ ). Nonetheless, despite a higher proportion of evidence-based updated web cancer pain guidelines was found among pain and supportive care medical societies (16.6%, 4/24) [16-19], while web-guideline delivery among oncology and anesthesiology societies did not overcome the 4.3% (Table 1).

When the societies’ sub-types were analyzed, a higher proportion of web recommendations for physicians was evident for supportive care (30%) [17-19], and medical oncology societies (12%) [21,24,25], and were null or almost null across other societies subtypes (Table 1).

**Table 1.** Demographics of the scrutinized societies and caregivers organizations

	<i>Eligible</i> <i>n=364</i>	<i>2011 any Recomm.</i> <i>Cancer pain</i> <i>n=16</i>	<i>2018 any Recomm.</i> <i>Cancer pain</i> <i>n=44</i>	<i>2011 EB.U Guidelines</i> <i>Cancer pain</i> <i>n=4</i>	<i>2018 EB.U Guidelines</i> <i>Cancer pain</i> <i>n=17</i>
Continent					
Intercontinental	54	2	5	1	1
North America	69 <sup>#</sup>	6 <sup>#</sup>	12 <sup>#</sup>	1 <sup>#</sup>	4 <sup>#</sup>
South America	6	1	1	0	0
Europe	35	1	5	1	3
Africa	11	1	1	0	0
Asia	5	0	0	0	0
Oceania	2	0	0	0	0
Top 10 Developed Countries*					
Norway	4	0	0	0	0
Australia	16	0	1	0	0
New Zealand	7	0	0	0	0
USA	52	5	11	1	4
Ireland	10	0	0	0	0
Liechtenstein	0	0	0	0	0
Netherlands	9	0	3	0	3
Canada	17	1	1	0	0
Sweden	4	0	0	0	0
Germany	10	0	2	0	2
Other countries					
Japan	13	0	2	0	1
United Kingdom	18	3	6	1	1
Italy	11	2	4	0	1
Switzerland	14	0	0	0	0
Spain	13	0	1	0	1
Belgium	9	0	1	0	0
Denmark	7	0	0	0	0
France	12	0	0	0	0
China	15	0	0	0	0
Austria	10	0	0	0	0
Geographic economic area					
Australia - New Zeal.	23	0	1	0	0
Benelux	18	0	4	0	3
Germanophone	34	0	2	0	2
North American	69	6	12	1	4
Scandinavian	15	0	0	0	0
South European	36	2	5	0	2
UK-Ireland	28	3	6	1	1
East Asian	28	0	2	0	1
Society, category					
Anesthesia	79	2	6	0	1
Oncology	256	9	25	3	11
Pain & Supportive Care	24	4	11	1	4
Other	5	1	2	0	1

Continued on the next page

	Eligible n=364	2011 any Recomm. Cancer pain n=16	2018 any Recomm. Cancer pain n=44	2011 EB.U Guidelines Cancer pain n=4	2018 EB.U Guidelines Cancer pain n=17
Society, subtype					
Anesth. Comprehen.	45	1	5	0	1
Anesth. Other	34	1	1	0	0
Pain	14	3	6	1	1
Cancer Research	52	1	2	0	0
Radiation Oncology	34	0	5	0	1
Medical Oncology	25	2	5	1	3
Surgical Oncology	15	0	1	0	1
Supportive Care	10	1	5	0	3
Compr. CA. MGM**	71	5	10	2	5
Other Societies	64	2	4	0	2

Distribution of the scrutinized societies and caregivers organizations by location, type (anesthesiology, oncology, pain); eligibility, accessibility and relative guideline recommendations.\* Countries were selected from the top 10 countries from the human development index; \*\*Compr. Cancer Management, \*North American guidelines were obtained by the addition of USA+ Canada societies/organizations.

## Discussion

Our analysis provides strong evidence for lack of web-guidelines for physicians for the assessment and management of cancer-related pain. Astonishingly, even in 2018, in our study, only 6.8% (4/59) of the “gate-keepers” specialties (medical oncology and radiation oncology) involved in the management of cancer patients provided evidence-based updated recommendation for cancer pain in their web-sites. Of note, ASCO (American Society of Clinical Oncology – the major medical oncology society worldwide) provided evidence-based pain guidelines only for the restricted sub-setting of cancer survivors [21], while no guidelines were provided for patients with active disease in any setting considered (under treatment, under follow-up or palliation). At the same time, ESMO (European Society of Medical Oncology - the European counterpart for medical oncology and second worldwide provider) presented outdated guidelines, thought new cancer pain guidelines were in press at the time of writing of our report [33].

Neither ASTRO (American Society for Therapeutic Radiology and Oncology), nor ESTRO (European Society for Therapeutic Radiology and Oncology), provided relative recommendations in their web sites (Table 1).

Cancer pain is a major public health problem. The crucial question is why this low level of priority exists, especially when the prevalence of cancer-related pain appears to be very high, and considering that it may severely jeopardize quality of life and performance of normal daily activities [3-5]. In some cases, patients may fear pain more than potential death from their cancer and this fear

has aided the drive for the agenda of physicians-assisted suicide [34].

For all the above-mentioned threats the World Health Organization (WHO) developed guidelines to assist in the management of cancer pain more than 30 years ago [35]. Nonetheless, the cancer pain threat is far from being solved. To date, one third of the patients still did not receive pain medication proportional to their pain intensity levels [6], pain research, pain assessment and management remain suboptimal in everyday clinical practice with half of the patients believing that their quality of life is not considered a priority in their overall care by their health care professional [5-7]. Consequently, cancer patients' dissatisfaction is very high. Inevitably, patients and their family members are prone to find their solutions by themselves, frequently by surfing blindly in the internet [36]. Nonetheless, these blind internet searches are of particular threat and may jeopardize the same patients' outcomes since the cancer pain and cancer-cachexia Web information is largely dominated by the extremely strong market of para-medicine and counterfeit drugs [36,37].

Recently, the European Association for Palliative Care (EAPC) defined the untreated cancer pain as “scandal of global proportion”, as a combined action of EAPC, European Society of Medical Oncology (ESMO), the Pain Policy Studies Group (PPGS), the Union International Cancer Control (UICC) and the WHO underscored a lack of access to opioids medication at global level [38].

Can scarcity in guideline implementation modify medical thought in decision-making and generate deficits in cancer pain assessment / management in daily practice?



What triggers a determined medical society to establish guidelines on a certain subject?

An impressive number of medical, anesthesiology, and oncology societies have been developed over time and are engaged in providing flourishing professional and scientific activities. Many of these organizations have extensive membership bases and organize large meetings. In 2018, half of these societies provided guidelines, recommendations and position statements within their websites that have substantial influence upon their members, subscribers, and websites visitors [39-41]. Web clinical practice guidelines are important for translating evidence in medical decision-making and clinical practice applications, reducing undesirable practices, encouraging services of proven efficacy, improving patients' safety and reducing complications [10]. Nonetheless, billions of dollars are spent each year for guidelines recommending prematurely approved costly treatment of uncertain benefit [1] and for guideline recommending genomic diagnostic tests of equivocal utility [2]. One may thus wonder why these societies do not prioritize guideline implementation for a pivotal and common problem (cancer pain) in daily clinical practice?

Diverging causes, such as scarce funding, lack of motivation, lack of impact on professional development, no interest from stakeholders, conflicting roles or educational deficits in pre- or postgraduate settings should be examined. Thus, in some clinical situations, the flourishing of high professional activity of medical societies might not be translated in an equal benefit for patients.

Prevalence and severity of a determinate clinical entity, as well as the patients' expectancies from physicians might be substantially different from priorities of physicians and medical professional societies. Nowadays oncologists resemble more and more to molecular biologists, while patients are more and more seeking for a doctor who cares for them.

How to solve these discrepancies? To positively impact the development of clinical practice guidelines and put them on the web might represent a new challenging field for the future.

Our study presents some limitations. First of all, since there are no established validated searches for unearthing professional societies and organizations, some of them may have been missed by our searches. However, given the multiple layers of our search, and the large number of oncology societies retrieved, it is unlikely that prominent entities were missed and that missed societies

might change the global patterns of web-guideline provision. Details on this study methodology had been already published in the literature [36,37,42-44]. Secondly, the human development index (HDI) changes over time. Thus, in June 2018 (at the time of data extraction) [45], countries' position varied compared to the top 10 positions available in June 2011 [11]. Among the 188 nations analyzed by the HDI, 7 countries included of the top 10 HDI at the time of our analyses in the 2011 (Norway, Australia, USA, Ireland, Netherland, Canada, Germany) [11] continued to be in the top 10 at the time of our data extraction in June 2018 [45]. The remaining three countries continue to rank at the top of the list, all included in the top 15 positions (New Zealand 13/188, Sweden 14/188, and Liechtenstein 15/188) [45]. Thereafter, no significant biases may be attributed to country highest developmental national index migration at the two time-point of analyses.

In conclusion, our study outlined that overall cancer pain updated and evidence-based web-guidelines for physicians are remarkably scarce despite they seem to improve overtime. Moreover, the phenomenon is independent of continent, developmental index of the nation analyzed, oncology tradition and economic-geographic area.

Despite the fact one third of cancer patients did not receive adequate pain medications, medical oncology and radiotherapy societies fail to regularly produce updated cancer pain recommendations for their physicians, with most of these providing no or inconsistent or outdated guidelines. Cancer pain, who cares?

## Conflict of interests

Study concept and study design (DM, NPP, AV, KK); internet screening for available societies in 2011 (TL, KK); scrutiny of relative web sites in 2011 (TL, KK); discussion upon scrutiny uncertainties 2011 (DM, NPP, AV, TV); protocol review and amendment in 2017 (DM, NPP, AV, GZV, TL, KK, TV, PN); scrutiny of relevant web sites in 2018 (PF, CG, GZF, MY); discussion upon scrutiny uncertainties in 2018 (NP, FK); critical appraisal of the results 2011, 2018 and analyses (DM, GP, GZV, DV, EP, ET, PN); manuscript writing (DM, GZV); Final details in manuscript editing: GP.

## Conflict of interests

Authors have no conflicts of interest and no financial interest to declare.

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## Appendix 1

### Methods

#### *Identification of pertinent societies and caregivers*

In 2011 we constructed a database of anesthesiology, oncology and pain societies/organizations (educational, professional, health policymaker, caregivers) that might provide guidelines for cancer pain. We considered societies and organizations that were intercontinental (with a global outlook), continental (including two or more countries in the same continent), or national belonging to one of the top 10 countries with the highest development index [1].

Countries with a long lasting tradition in medical oncology (countries in which were performed the largest number of chemo/hormonal therapy randomized trials for advanced malignancies, based our previous meta-analyses [2-5]) but not included in the top 10 high developed countries, were further included in the internet searches (Table of main manuscript).

We performed internet searches (last search June 2011) involving possible combinations of 11 subject matters ("anesthesiology", "anesthesiological", "cancer", "oncology", "medical oncology", "clinical oncology", "radiation oncology", "radiotherapy", "surgical oncology", "cancer research", "supportive oncology"), 3 terms for educational and policymaker societies ("society" or "association" or "organization") and 30 terms of geographic identifiers (10 pertaining to continents: "Asian", "American", "North American", "South American", "America Latina", "African", "European", "Australian", "Oceania", "International"; 10 pertaining to eligible countries by the highest development index [1]: "Norway", "Australia", "New Zealand", "USA", "Ireland", "Liechtenstein", "Netherlands", "Canada", "Sweden", "Germany"; and 10 pertaining to countries with a long lasting tradition in oncology but not included in the top 10 high developed countries: "Austria", "Belgium", "China", "Denmark", "France", "Japan", "Italy", "UK", "Spain", "Switzerland"). Due to notable economy and development differences between South and North American countries, the continental entities were separately searched and analyzed for North and South America [1]. This methodology for the identification of pertinent societies and caregivers had been previously used and described [6-8].

National associations identified were further grouped by geographical-economic areas a) Australia-New Zealand, b) Benelux (Belgium and Netherlands), c) Germanophone (Austria, Germany, Liechtenstein Switzerland), d) North American (US and Canada), e) Scandinavian (Denmark, Norway and Sweden), f) South European (France, Italy and Spain), g) United Kingdom of Great Britain and Ireland, h) East Asian (Japan and China).

The first 100 results for each internet search were scrutinized. We included both societies with accessible web pages, as well as those whose presence was mentioned in some URL but did not have a webpage or their link was not functional (under construction or not working).

#### *Outcomes*

To scrutinize the global magnitude of updated and evidence-based guideline recommendations for cancer-pain for physicians on the web and its changes over-time. Both anesthesiology and oncology societies were analyzed.

We considered as "updated" all the web guidelines that have been produced within five years or the web page should have been reviewed or lastly adjourned within five years by the implementing organization. If time period was higher than five years we considered the guidelines as outdated. Evidence-based were considered all guidelines including randomized controlled trials and/or meta-analyses in their references.

Furthermore, we considered eligible only cancer pain guideline pertaining the general assessment and management of cancer pain. "Solo" specialist guideline (such as "solo" radiation protocols for bone pain among radiotherapy societies, or "solo" intrathecal use of opioids among anesthesiology societies) were not included in primary outcome analyses.

#### *Data extraction from eligible website*

From each pertinent anesthesiology / oncology / pain society and caregiver website we recorded its name, the URL, continent and/or country, sub-specialty setting (anesthesia research, comprehensive anesthesia managing, pain, supportive oncology, medical oncology, surgical oncology, radia-



tion oncology, cancer research) and whether they provided any guideline on any subject matter (any setting) and on cancer pain related guideline (last update for baseline screening june 2011, last updated for first interim analyses june 2018, next analyses are programmed for 2025). Whenever there was availability to perform electronic battle-searches within the website, we used the terms “guidelines» or “recommendations” or “position statements” in English. For non English websites, we translated these terms into the language the website used.

Whenever any eligible guidelines were available, we recorded whether recommendations were freely accessible through the website and whether they provided separate information developed by the society/organization itself or a link to another society/organization’s guidelines.

For each cancer pain guideline retrieved, we further addressed if it was implemented for patient or for physicians, whether it pertained cancer pain assessment or treatment setting. In order to evaluate guidelines consistency we further extract whether references were provided to support the guidelines statements, whether the evidence from randomized controlled trials and/or meta-analyses were provided to support the guidelines statements.

At each time point of analyses (2011, 2018) at first screening, we did not use a strict definition for guideline and any kind of recommendation (“guidelines” or “recommendations” or “position statements” or “suggestions” or “indications”) both for patients and physicians were recorded. However in the analyses for primary outcomes only evidenced

based and updated guidelines for physicians were considered of value. Guidelines from web pages to be updated for more than five years were considered outdated.

Since all medical societies may have not the possibility to produce “own” guidelines, and considering that medical societies in their websites may provide guidelines either as “own produced guidelines”, either as a “link” to guidelines produced by other medical societies, we considered of value both guideline produced by “own” and/or as a “link” to a specific web site of another society with web recommendation for cancer pain.

### Analyses

We evaluated whether the proportion of associations/organizations present intercontinental and international variations and the possible role played by the society type and subtype in guideline implementation. Group comparisons for categorical variables used chi-square, Fisher’s exact test, and Yates’  $\chi^2$ . Whenever data scarcity was too high to allow analyses we used descriptive statistics.

### Protocol amendment in 2017

In November 2017, considering the scarcity of updated cancer pain web-guidelines available, the board of primary investigators decided to recognize as updated all guidelines produced or adjourned within a period of five years (in the initial protocol updated guidelines/recommendations should have been provided or adjourned within a period of three years).

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## Appendix 2

### List of the 364 societies/organizations scrutinized

World Federation Societies of Anesthesiologists  
ACORN CRO  
Africa Oxford Cancer Consortium  
African Cancer Organization  
African Organisation for Research and Training in Cancer  
African Radiation Oncology Group  
African Women’s Cancer Awareness Association

Age Anaesthesia Association  
Aller Over Cemothérapie  
Alliance mondiale contre le cancer  
American Academy of Pain Management  
American Anti-Cancer Society  
American Association for Cancer Education  
American Association for Cancer Research  
American Brachytherapy Society  
American Cancer Society

- American College of Oncology Administrators  
 American College of Radiation Oncology  
 American Institute for Cancer Research  
 American Pain Society  
 American Society for Therapeutic Radiology and Oncology  
 American Society of Anesthesiologists  
 American Society of Clinical Oncology  
 American Society of Preventive Oncology  
 American Society of Regional Anesthesia and Pain Medicine  
 American-Italian Cancer Foundation  
 Anaesthesia Patient Safety Foundation  
 Anaesthetic Research Society  
 Arbeitsgemeinschaft Internistische Onkologie  
 Asian American Network for Cancer Awareness  
 Asian Clinical Oncology Society  
 Asian Federation of Organizations for Cancer Research and Control  
 Asian Fund for Cancer Research  
 Asian- Oceanian Clinical Oncological Society  
 Asian Pacific Organization of Cancer Prevention  
 Association for Directors of Radiation Oncology Programs  
 Association for International Cancer Research  
 Association for Research on Treatment against Cancer  
 Association for the International Development of Anesthesia  
 Association Latin American for Therapeutic Radiation Oncology (ALATRO)  
 Association of Physician Assistants in Oncology  
 Association of American Cancer Institutes  
 Association of Anesthesia Clinical Directors  
 Association of Burns and Reconstructive Anaesthetists  
 Association of Cancer Executives  
 Association of Community Cancer Centers  
 Association of European Cancer Leagues  
 Association of Freestanding Radiation Oncology Centers  
 Association of Integrative Oncology and Chinese Medicine  
 Association of Residents in Radiation Oncology  
 Association of University Anesthesiologists  
 Associazione Anestesisti Rianimatori Ospedalieri Italiani  
 Australasian Society of Anaesthesia Paramedical Officers  
 Australian Cancer Research Foundation  
 Australian Society of Anaesthetists  
 Austrian Cancer Aid Society  
 Austrian cancer association  
 Austrian Society of Anaesthesiology, Resuscitation and Intensive Care  
 Austrian Society of Hematology and Oncology  
 Austrian Society of Oncology  
 Austrian Society of Oncology Pharmacy  
 Austrian Society of Radiation Oncology  
 Austrian Society of Surgical Oncology  
 Belgian Association for Cancer Research  
 Belgian Association for Radiotherapy and Oncology  
 Belgian Federation Against Cancer  
 Belgian Pain Society  
 Belgian Society of Medical Oncology  
 Belgian Society of Surgical Oncology  
 Berufsverband Deutscher Anaesthesisten  
 British Accelerator Science and Radiation Oncology Consortium  
 British Anaesthetic & Recovery Nurses Association  
 British Association of Cancer Research  
 British Association of Cancer United Patients  
 British Association of Surgical Oncology  
 British Oncological Association  
 British Oncology Pharmacy Association  
 Canadian Association of General Practitioners in Oncology  
 Canadian Association of Medical Oncologists  
 Canadian Association of Nurses in Oncology  
 Canadian Association of Pharmacy in Oncology  
 Canadian Association of Provincial Cancer Agencies  
 Canadian Association of Radiation Oncologists  
 Canadian Cancer Action Network  
 Canadian Cancer Advocacy Network  
 Canadian Cancer Research Alliance  
 Canadian Cancer Society / National Cancer Institute of Canada  
 Canadian Oncology Societies  
 Canadian Partnership Against Cancer  
 Canadian Society for Surgical Oncology  
 Cancer Advocacy Coalition of Canada  
 Cancer assistance network  
 Cancer Association of South Africa  
 Cancer Australia  
 Cancer care, Inc.  
 Cancer Control New Zealand  
 Cancer Council Australia  
 Cancer Cure Foundation  
 Cancer Federation Inc.  
 Cancer Foundation of China / FORMER= Chinese Cancer Research Foundation  
 Cancer Hope Network  
 Cancer Patients Foundation  
 Cancer Project  
 Cancer research foundation of America  
 Cancer Research Initiative of South Africa  
 Cancer Research Institute  
 Cancer Research Society of Canada  
 Cancer Research UK  
 Cancer Society of New Zealand  
 Cancer Support Association of Western Australia  
 Cancer Support France  
 Cancer Trials New Zealand  
 Cancérologues Sans Frontières / "Oncologists Without Borders  
 Canteen Ireland  
 Central European Cooperation Oncology Group  
 China East Radiation Oncology Group  
 Chinese American Society of Anesthesiology  
 Chinese Anti-Cancer Association  
 Chinese cancer research foundation (China)  
 Chinese Center for Disease Control and Prevention  
 Chinese Medical Association  
 Chinese Medical Association Society of Oncology  
 Chinese Oncology Society (Taiwan)  
 Chinese Preventive Medicine Association  
 Chinese Society of Anesthesiologists  
 Chinese Society of Clinical Oncology  
 Chinese Society of Therapeutic Radiology and Oncology / Chinese Society of Radiation Oncology  
 Clinical Cancer Research Center  
 Clinical Oncology Society of Australia  
 Coc Member Organization Cancer Care Initiatives  
 Community oncology alliance  
 Complementary and Alternative Medicine for Cancer  
 Confederación Latinoamericana de Sociedades de Anestesiología  
 Confederation of European National Societies of Anaesthesiologists  
 Conseils pour la chimiothérapie  
 Cris Foundation for Cancer Research

- Cure Cancer Australia Foundation  
 Danish Anaesthesiological Organisation  
 Danish Cancer Society  
 Danish Research School in Molecular Cancer Research  
 Danish Society of Intensive Care Therapy  
 Danish Society of Anaesthesiology and Intensive Care Medicine  
 Danish Society of Medical Oncology  
 Dansk Selskab for Cancerforskning  
 Deutsche Gesellschaft für Anästhesiologie und Intensivmedizin  
 Deutsche Interdisziplinäre Vereinigung für Intensiv- und Notfallmedizin  
 Dutch Association of Medical Oncology  
 Dutch Association of Oncology Nurses  
 Dutch Belgian Hemato-Oncology Cooperative Group  
 Dutch Cancer Society  
 Dutch Society for Radiotherapy and Oncology  
 Dutch Society of Oncology  
 Dutch Society of Surgical Oncology  
 Eastern Cooperative Oncology Group  
 European (Spain) Website of Anaesthesia, Intensive Care and Pain Medicine  
 European Academy of Anaesthesiology  
 European Association for Cancer Education  
 European Association for Cancer Research  
 European Cancer Organisation  
 European cancer prevention organization  
 European Masters Program in Radiation Sciences for Oncology  
 European Organization for Palliative Care  
 European Organization for Research and Treatment of Cancer  
 European Palliative Care Research Collaborative  
 European School of Oncology  
 European Society for Hyperthermic Oncology  
 European Society for Intravenous Anaesthesia  
 European Society for Medical Oncology  
 European Society for Therapeutic Radiology and Oncology  
 European Society of Anesthesiology  
 European Society of Cancer Immunology and Immunotherapy  
 European Society of Intensive Care Medicine  
 European Society of Oncology Pharmacy  
 European Society of Surgical Oncology  
 Federación Panamericana e Ibérica de Sociedades de Medicina Crítica y Terapia Intensiva  
 Fédération Nationale des Centres de Lutte Contre le Cancer  
 Federation of Spanish Cancer Societies  
 Fight Cancer Foundation  
 Foundation for Anaesthesia Education and Research  
 Foundation for European Education in Anaesthesiology  
 Foundation of Geriatric Oncology Netherlands  
 Freesia Group for Cancer Charities Spain  
 French National Institute of Cancer  
 French Society of Radiation Oncology  
 French Society of Surgical Oncology  
 German Cancer Aid  
 German Cancer Research Center  
 German Cancer Society  
 German Society for Hematology and Oncology  
 German Society of Radiation Oncology  
 Italian Association of Cancer Patients  
 Intercultural Cancer Council  
 Intercultural Cancer Council Caucus  
 International Agency for Research on Cancer  
 International Anesthesia Research Society  
 International Association for the Study of Pain  
 International Cancer Biomarker Consortium  
 International Cancer Microenvironment Society  
 International Cancer Rehabilitation Association  
 International Network for Cancer Treatment and Research  
 International Organization for Cancer Prevention and Research  
 International Society for Biological Therapy of Cancer  
 International Society for Cell and Gene Therapy of Cancer  
 International Society for Oncology and Biomarkers  
 International Society of Cellular Oncology  
 International Society of Intraoperative Radiation Therapy  
 International Society of Oncology Pharmacy Practitioners  
 International Union Against Cancer  
 Ireland Cooperative Oncology Research Group  
 Irish Association for Cancer Research  
 Irish Association for Nurses in Oncology  
 Irish Cancer Data Association  
 Irish Cancer Society  
 Irish Institute of Radiography and Radiation Therapy  
 Irish Society of Medical Oncology  
 Irish Society of Surgical Oncology  
 Israel Cancer Association  
 Italian Association for Cancer Research  
 Italian Association for Radiation Oncology  
 Italian Cancer Society  
 Italian Foundation for Cancer Research  
 Italian Institute for Cancer Research and treatment  
 Italian Institute of Medical Oncology  
 Italian League Against Cancer  
 Italian Society for Surgical Oncology  
 Japan Clinical Cancer Research Organization  
 Japan Society of Clinical Oncology  
 Japan Society of Therapeutic Radiology and Oncology  
 Japanese Cancer Association  
 Japanese Foundation for Cancer Research  
 Japanese Organization of Radiotherapy Quality Management  
 Japanese Society of Anesthesiologists  
 Japanese Society of Hyperthermic Oncology  
 Japanese Society of Medical Oncology  
 La Ligue Nationale contre le Cancer  
 La Sociedad Española del Dolor  
 La Sociedad Española de Anestesiología, Reanimación y Terapéutica del Dolor  
 L'Association Ensemble contre la douleur  
 L'Association pour la Recherche sur le Cancer (ARC)  
 Latin American and Caribbean Society of Medical Oncology  
 Latin American Association for Palliative Care  
 Latin American Cancer Research Coalition  
 Macmillan Cancer Support  
 Medical Oncology Group of Australia  
 Mediterranean School of Oncology  
 Multinational Association of Supportive Care in Cancer  
 National Association of Professional Cancer Coaches  
 National Cancer Institute  
 National Cancer Registrars Association  
 National Cancer Research Institute  
 National Cancer Research Network  
 National Coalition for Cancer Survivorship  
 National Comprehensive Cancer Network  
 National Foundation for Cancer Research  
 National Health and Medical Research Council  
 National Institute of Health and Excellence

- Navy Anesthesia Society  
 Nederlandse Vereniging voor Anesthesiologie  
 New Zealand Society for Oncology  
 New Zealand Society of Anaesthetists  
 Nordic Cancer Union  
 Norwegian Cancer Society  
 Norwegian Group on Inherited Cancer  
 Norwegian Society of Anaesthesiology  
 Oncology Nutrition Dietetic Group  
 Organisation of European Cancer Institutes  
 Organization for Oncology and Translational Research  
 Österreichische Gesellschaft für Internistische und Allgemeine Intensivmedizin  
 Peripheral Regional Anesthesia  
 Physician Assistants in Anesthesia  
 Prevent Cancer Foundation  
 Radiation Therapy Oncology Group  
 Royal Australian & New Zealand College of Radiologists  
 Royal College of Anaesthetists  
 Schweizerische Gesellschaft für Intensivmedizin-Société Suisse de Médecine Intensive  
 Scientific Association of Swiss Radiation Oncology  
 Scottish Intercollegiate Guidelines Network  
 Sino-American Network for Therapeutic Radiology and Oncology  
 Sociedad Española de Enfermería Oncológica  
 Sociedad Española de Medicina Intensiva, Crítica y Unidades Coronarias  
 Società Italiana di Anestesia, Analgesia, Rianimazione e Terapia Intensiva  
 Société de Réanimation de Langue Française  
 Société Française d'Anesthésie et de Réanimation  
 Societe Francaise du cancer  
 Société suisse d'anesthésiologie et de réanimation/Schweizerische Gesellschaft für Anästhesiologie und Reanimation  
 Society for Ambulatory Anesthesia  
 Society for Anesthesia and Resuscitation of Belgium  
 Society for Education in Anesthesia  
 Society for Education in Anesthesia  
 Society for Integrative Oncology  
 Society for the Advancement of Geriatric Anesthesia  
 Society of Academic Anesthesiology Associations  
 Society of Neurosurgical Anesthesia and Critical Care  
 Society of Radiation Oncology Administrations  
 Society of Surgical Oncology  
 South African Oncology Consortium  
 South African Society of Clinical and Radiation Oncology  
 South African Society of Medical Oncology  
 South East Asian Radiation Oncology Group (SEAROG)  
 Southeast Anesthesiology Consultants  
 Spanish Association Against Cancer  
 Spanish Association for Cancer Research  
 Spanish Association of Radiotherapy and Oncology  
 Spanish Society of Chemotherapy  
 Spanish Society of Medical Oncology:  
 Spanish Society of Surgical Oncology  
 Supportive and Rehabilitation Oncology  
 Swedish Cancer Society  
 Swedish Society for Anaesthesiology and Intensive Care  
 Swedish Society of Oncology  
 Swedish Surgical Society  
 Swiss Bridge Foundation  
 Swiss Cancer League, Swiss League Against Cancer  
 Swiss Cancer Research Foundation  
 Swiss Federation Against Cancer (Oncosuisse)  
 Swiss Group of Clinical Cancer Research  
 Swiss Institute for Experimental Cancer Research  
 Swiss Radiation Oncology Centers  
 Swiss Society for Oncology  
 Swiss Society of Medical Oncology  
 Swiss Society of Surgery  
 Taiwan Clinical Oncology Society  
 The American Academy of Pain Medicine  
 The American Board of Anesthesiology  
 The American Academy of Anesthesiologist Assistants  
 The American Chronic Pain Association  
 The American College of Surgeons Oncology Group (ACOSOG)  
 The Anaesthesia Research Trust  
 The Anesthesia Foundation  
 The Association of Anaesthetists of Great Britain and Ireland  
 The Association of Anesthesia Clinical Directors  
 The Australian Organisation for Young People Living with Cancer  
 The Australian Pain Society  
 The Australian Patient Safety Foundation  
 The Australian Society of Post Anaesthesia and Anaesthesia Nurses  
 The Austrian Cancer league  
 The Belgian Society of Intensive Care Medicine  
 The British Medical Acupuncture Society  
 The British Pain Society  
 The Canadian Anesthesiologists' Society  
 The Cancer Information and Support Society  
 The European Cancer Patient Coalition  
 The European Oncology Nursing Society  
 The European Society of Digestive Oncology  
 The European Society of Regional Anesthesia and Pain Therapy  
 The Global Regional Anesthesia website  
 The Intensive Care Society of Ireland  
 The International Society for Anesthetic Pharmacology  
 The International Spine Intervention Society  
 The Japan Cancer Society  
 The Japanese Association for Molecular Target Therapy of Cancer  
 The National Board of Anesthesiology  
 The Neuroanaesthesia Society of Great Britain and Ireland  
 The New Zealand Association of Cancer Specialists  
 The Royal College of Radiologists  
 The Society of Anaesthetists of Hong Kong  
 The South African Society of Anaesthesiologists  
 The South Asian Association for Regional Cooperation  
 The UK Society for Intravenous Society  
 Trans Tasman Radiation Oncology Group  
 World Anesthesia Society  
 World Cancer Research Fund International  
 World Federation Societies of Anesthesiologists  
 World Federation of Surgical Oncology Societies  
 World Institute of Pain